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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,353	11/19/2001	Xiaodong C. Xu	MTC6788 (39-21 (52589))	8762
321	7590	09/09/2004	EXAMINER	
SENNIGER POWERS LEAVITT AND ROEDEL ONE METROPOLITAN SQUARE 16TH FLOOR ST LOUIS, MO 63102			CLARDY, S	
			ART UNIT	PAPER NUMBER
			1616	

DATE MAILED: 09/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/988,353

Applicant(s)

XU ET AL.

Examiner

S. Mark Clardy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) See Continuation Sheet is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 09/926,521.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8/6/04</u> . | 6) <input type="checkbox"/> Other: _____ |

Continuation of Disposition of Claims: Claims pending in the application are 3-32,67,68,70,71,73-76,78,79,84-87,89-92,94,95,97,98,101-123,128-130,140-142 and 146-148.

Continuation of Disposition of Claims: Claims rejected are 3-32,67,68,70,71,73-76,78,79,84-87,89-92,94,95,97,98,101-123,128-130,140-142 and 146-148.

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Claims 3-32, 67, 68, 70, 71, 73-76, 78, 79, 84-87, 89-92, 94, 95, 97, 98, 101-123, 128-130, 140-142, and 146-148 are pending in this application which is a continuation in part of SN 09/926,521, which was filed under 35 USC 371 as the national stage application of PCT/US01/16550, filed May 21, 2001, which claims the benefit under 35 USC 119(e) of US Provisional Applications No. 60/206,628 (May 24, 2000), 60/205,524 (May 19, 2000), 60/273,234 (March 2, 2001), and 60/274,368 (March 8, 2001). The following continuation applications have also been filed: 09/988,340; 09/988,352.

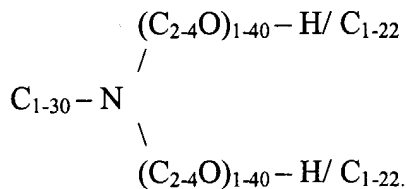
Claims 1, 2, 33-66, 69, 72, 77, 80-83, 88, 93, 96, 99, 100, 124-127, 131-139, and 143-145 have been canceled.

Applicants elected the invention/species comprising:

Glyphosate (acid, salt, or ester)

Oxalic acid (as the dicarboxylic acid)¹

Dialkoxylated Amine Surfactant (formula 36, page 23):



The weight ratio of surfactant to oxalic acid enhancing compound (sf:ox) component is 5:1 to about 40:1 (claim 3).

Applicants' invention lies in the discovery that the enhancer compound (i.e., oxalic acid) enhances plant cell membrane permeability, thus enhancing the transport of glyphosate through

¹Claims 67, 68, 70, 71, 73-76, 78, 79, 84-87, 89-92, 94, 95, 97, 98, 113-123, 146-148

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the phloem resulting in increased phytotoxicity. The mechanism is described as being independent of any metal ion chelating effect (response, p. 41).

Claims 9, 15, 21, 28, 67, 68, 70, 71, 73-76, 78, 79, 84-87, 89-92, 94, 95, 97, 98, 107, 112-123, 130, 142, and 146-148, are all drawn to compositions/methods comprising glyphosate and oxalic acid. In the remainder of the pending claims, the enhancer (i.e., oxalic acid) component is functionally claimed.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-32, 67, 68, 70, 71, 73-76, 78, 79, 84-87, 89-92, 94, 95, 97, 98, 101-123, 128-130, 140-142, and 146-148 are again rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of Hasebe et al (US 5,863,863), Beestman et al (US 4,159,901), Wright et al (US 5,750,468), and Turner², for reasons of record (repeated below).

Hasebe et al, again, teach liquid enhancer compositions for amino acid series herbicides (i.e., glyphosate (see column 5) comprising oxalic acid or a salt thereof, and a tertiary amine (column 2) which may be a dialkoxylated amine surfactant such as POE(15) beef tallowamine (structure 2, column 7). See also compositions 7-12 of Table 1. The molar ratio of the oxalic acid component to the N-containing surfactant is in the range of 0.1:1 to 10:1 (abstract). In examples 7-12 of Table 1, the molar ratio of N-surfactant to oxalic component (sf:ox) is 1:3, with the disclosed weight ratios (g:g) ranging from 20:5 to 20:17, or about 4:1 to about 1:1 by weight for a molar ratio of 1:3. Calculating for a molar ratio of 1:1, the weight ranges for the examples would be 20:1.7 to 20:5.7, or about 12:1 to 3.5:1; and:

for a 0.1:1 molar ratio:	1.2:1 to 0.35:1
for a 10:1 molar ratio:	120:1 to 35:1.

² Turner, D. J. "Effects on glyphosate performance of formulation, additives and mixing with other herbicides". Chapter 15 in *The Herbicide Glyphosate*. Grossbard et al, ed. Butterworths : Boston. P. 221-239. 1985.

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Thus, on the basis of the disclosed 0.1:1 to 10:1 molar sf:ox ratio and the provided examples, weight ratios, Hasebe et al teach that in terms of weight, the sf:ox ratios range from at least 0.35:1 to 120:1, encompassing applicants' 5:1 to 40:1 range in claim 3.

Beestman et al, again, teach that it was known to formulate glyphosate, or its salts or esters (columns 10-11) with surfactants (column 3), including dialkoxylated alkylamines (lines 51-60), such as ethoxylated tallowamines (see structure of surfactant A, top of column 7). The compositions of Beestman et al contain a thiol compound to reduce corrosion of metal surfaces. This patent also teaches that it was known to add oxalic acid to glyphosate compositions in order to counteract the activity reducing effect of hard water, i.e., calcium or magnesium ions in the dilution water (col 7, lines 38-65). One of ordinary skill in the art would be motivated to combine the specific disclosed salts or esters of glyphosate as taught in Beestman et al with the enhancing composition of Hasebe et al because Hasebe et al is not limited to glyphosate acid, and because the same adjuvant materials are used in the formulations of Beestman et al, albeit for a different purpose. Beestman et al does refer to the utility of oxalic acid for restoring degraded phytotoxicity of glyphosate resulting from calcium or magnesium ions. This reference, however, is used to show the equivalence of the many different salts and esters of glyphosate as herbicidal agents, and that they may be combined with the alkoxylated alkylamine surfactants and oxalic acid derivatives.

Wright et al, again, teach the combination of glyphosate with etheramine surfactants in concentrates (up to about 500 g ae/l) that may be either liquid or dry (col 5, lines 23-65).

Turner, again, teaches that the addition of surfactants generally improves the activity of glyphosate (p.223-225), and that polybasic acids such as oxalic acid also enhance its activity (p. 230). While this may be attributed to the multivalent metal ion chelating ability of the polybasic acids, the fact remains that they are taught as being useful for enhancing the herbicidal effectiveness of glyphosate. It is not seen where Turner refers to the effect as being one of restoring the effectiveness of glyphosate, which had been degraded by the presence of calcium or other ions. Turner simply states that the activity of glyphosate is enhance by oxalic acid, and suggests that it may be due to its chelating ability. Finally, Turner refers to the various conventional ways in which herbicides may be formulated as liquid (aqueous or oil based) or solid compositions (p. 221-222).

One of ordinary skill in the art would be motivated to combine these references because they disclose the herbicidal enhancing effects of both alkoxylated amine surfactants and oxalic acid in glyphosate compositions. The ordinary artisan would be motivated to combine both the surfactants and oxalic acid derivatives with glyphosate because they enhance glyphosate activity.

Thus, again, it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to have combined applicants' elected etheramine surfactants and oxalic acid derivatives with glyphosate because the prior art teaches that these components were both known to enhance the herbicidal activity of glyphosate. While applicants' mechanism of action is not disclosed in the prior art, it does disclose the combination claimed herein as well

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as the enhancement of herbicidal activity, thus the claims are obvious over the cited prior art. Inasmuch as several derivatives of glyphosate, oxalic acid, and dialkoxylated alkylamine surfactants are taught in the cited references as being useful in combination, the recited derivatives herein are all seen as obvious over the cited prior art. Further, applicants' weight ratio ranges appear to be encompassed by those of the prior art and are thus seen as being obvious, absent evidence of criticality. Finally, given the conventional nature of liquid and solid formulations in the herbicidal art as taught in Wright et al, the selection of a liquid or solid vehicle for formulating glyphosate would appear to be an obvious variation.

Applicants argue that compositions with the claimed s.f.ox weight ratios exhibit unexpected results with respect to compositions outside the claimed range. It is not seen where this has been established, nor have applicants pointed out specifically where this has been shown. Note that normally, change in temperature, concentration, or both, is not a patentable modification; however, such changes may impart patentability to a process if the ranges claimed produce a new and unexpected result which is different in kind and not merely in degree from results of prior art; such ranges are termed "critical" ranges, and applicant has burden of proving such criticality; even though applicant's modification results in great improvement and utility over prior art, it may still not be patentable if the modification was within the capabilities of one skilled in the art; more particularly, where the general conditions of the claim are disclosed in the prior art, it is not inventive to discover optimum or workable ranges by routine experimentation. In re Aller et al. 105 USPQ 233. Further, it appears that all testing has been done with oxalic acid as the enhancer compound. In order for the generic claims (i.e., those without oxalic acid specifically recited) to be found allowable, additional test data must be provided using different enhancer compounds. Objective evidence of nonobviousness must be commensurate in scope with the scope of the claims. In re Tiffin, 171 USPQ 294. A showing limited to a single species

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can hardly be considered probative of the invention's nonobviousness in view of the breadth of the claims.

No claim is allowed.

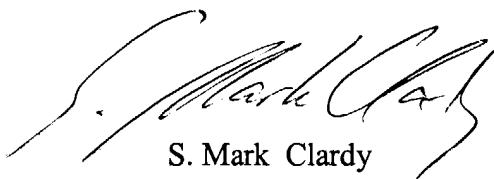
THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Mark Clardy whose telephone number is 571-272-0611. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Kunz can be reached on 571-272-0887. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



S. Mark Clardy
Primary Examiner
Art Unit 1616

S. Mark Clardy
September 7, 2004